Lattice Materials Corp.

Montana Manufacturing Extension Center

Lattice Grows Space and Polishes Performance

Client Profile:
Lattice Materials Corp, located in Bozeman, Montana, is a leading supplier of silicon and germanium products to the world market. The company offers value-added customization such as curving, CNC machining, and polishing. Its optics, sputter targets, and other custom parts are found in a variety of applications such as lenses and windows for night vision optics, motion sensors, critical components for revolutionary surgical instruments and beam steerage mirrors for CO2 lasers. Some are used in airborne applications for the military as in fighter and attack helicopters systems. Customers include small prototype companies as well as Fortune 500 corporations. Currently employing 42 people, Lattice also grows crystals on-site to ensure a supply of needed material.

Situation:
Lattice accepted the challenges in the high growth arena of infrared optics and precision manufacturing. A recent facility expansion was driven by increased demand for its products from the defense industry and more call for value-added customization. The new building included more administrative and manufacturing space, integrating with existing facilities at the location where the business started in 1989. Meanwhile new solar technologies had put heavy demand on the worldwide silicon supply so adding capacity in the growth room was essential. Anticipating continued growth, Lattice increased its manufacturing space by 30 percent. But, like most manufacturers, early growth came in bits, adding equipment by necessity and placing it where it would fit without considering flow. Not unlike most small manufacturers, things ended up a bit fractured. Lattice asked the Montana Manufacturing Extension Center (MMEC), a NIST MEP network affiliate, for help with the realignment of production flow.

Solution:
Lattice asked MMEC to perform studies in three areas that would expand and move into new space -- the ingot room, the shipping area, and a special review of its "clean line" and how it could be expanded and still fit into the flow. The flow changes would allow the growth room and custom, value-added production areas to expand into freed-up space. Using a value stream mapping approach to get started, the layout team carefully looked at flow from a "what will it look like three to five years out" point of view in terms of personnel, automation, volume, and new technologies. Options for improvements based on what employees identified, what the team had seen, and best practices from Lean Manufacturing were explored using Visio and Autocad software with a related strength/weakness analysis. Challenges included fitting expanded production into allocated space and taking a close look at reducing materials handling. The raw material at Lattice is unique starting with silicon ingots [the size of a 3-pound coffee can or larger]. These are susceptible to chipping and breakage as product moves through production. Throughout the project, MMEC researched related issues like lighting improvements and put the company in touch with a local lighting specialist. The company appreciated the extra support, and plans are in the works to retrofit new lighting in the older part of the building.

MMEC also provided an assessment of future cooling tower capacity and an energy saving recommendation to upgrade those controls.
Reduced materials handing has minimized breakage by 30 to 40 percent with the changes now in place; more is expected. To add capacity in the cleaning area, an additional rinse sink and ultrasonic cleaner were placed in the system along with better lighting, exhaust and storage. The new clean line increased throughput with the addition of a heated ultrasonic rinse. The parts air dry much faster, eliminating the hand drying of parts. Management said it has been a great solution. During improvements, special attention was paid to feedback from employees -- the people who know how things are done and have ideas about how to make things work more smoothly. Because their input is important, MMEC mapped out the sequence of production for each type of part, interviewed employees on what goes on in their areas, what frustrations they were experiencing and any recommendations. Lead employees were asked to show their people iterations derived in planning meetings, and large paper layouts were posted in several areas to help gain feedback. Many employee ideas were incorporated in the final layout. Now materials are on shelves in the ingot room with plenty of storage for full ingots and cut parts, as well as finished goods. MMEC applied the concept of a visual work space using color coded bins and such for storing and identifying materials in the expanded storage area. Core stock is now inside and accessible rather than locked away in adjacent space, reducing breakage and becoming a time saver. The new configurations nearly tripled the size of the ingot room. The shipping space is now in the newer part of the building, with more floor space and air-conditioning. A bigger pass-through window for finished goods orders was added and has been very helpful. Final inspection of finished goods is done in this area. The space is now more professional, has good lighting, and a tiled floor. There is room for all shipping supplies and order handling. More inspection equipment and gauges and an additional work station have been added for more efficiency and output. The expansion and changes to meet growing demand for Lattice products has raised employee satisfaction, reduced handling, and improved safety. Flow is becoming more streamlined and new equipment has been added.

Results:
* Reduced materials handling minimized breakage by 30 percent to 40 percent.
* Improved safety.
* Streamlined workflow.
* Solicited feedback from employees regarding final layout.
* Purchased new equipment.
* Anticipated 20 percent growth in 2006.
* Improved employee satisfaction.
* Streamlined work flow.
* Purchased new equipment.

Testimonial:
"The whole MMEC staff provides a wonderful resource to businesses. It is like having an experienced manufacturing engineering department on your staff at a fraction of the cost."
Dave Allard, Plant Manager